## **AMENDMENTS TO THE CLAIMS:**

This listing of claims will replace all prior versions, and listings, of claims in the application. Where claims have been amended and/or canceled, such amendments and/or cancellations are done without prejudice and/or waiver and/or disclaimer to the claimed and/or disclosed subject matter, and Applicants reserve the right to claim this subject matter and/or other disclosed subject matter in a continuing application.

1. (previously presented) A method for controlling exchange coupling of grains of a magnetic medium, the method comprising:

providing a magnetic medium having magnetic grains; and

irradiating the magnetic medium with ions having an acceleration voltage of between 10 keV and 50 keV to induce exchange coupling between grains of the magnetic medium.

- 2. (original) The method according to claim 1, wherein the ions are selected from the group consisting of  $H^+$ ,  $He^+$ ,  $Ne^+$ ,  $Ar^+$ ,  $Kr^+$ , and  $Xe^+$ .
- 3. (original) The method according to claim 1, further comprising ionizing a gas to create the ions.
- 4. (original) The method according to claim 1, wherein the ions are selected from the group consisting of  $Ga^+$ ,  $Hg^+$ , and  $In^+$ .
- 5. (original) The method according to claim 1, further comprising generating the ions from a liquid metal ion source.
  - 6. (canceled)

- 7. (previously presented) The method according to claim 1, wherein irradiating the magnetic medium irradiates the magnetic medium with ions having an acceleration voltage of between 20 keV and 30 keV.
- 8. (original) The method according to claim 1, wherein irradiating the magnetic medium irradiates the magnetic medium with ions having an energy that substantially affects an entire thickness of the magnetic medium.
- 9. (withdrawn) The method according to claim 1, wherein the magnetic medium includes granular magnetic particles on a tape.
- 10. (withdrawn) The method according to claim 1, wherein the magnetic medium includes granular magnetic particles on a disk.
- 11. (original) The method according to claim 1, wherein the magnetic medium has a perpendicular magnetization.
- 12. (original) The method according to claim 1, wherein the magnetic medium has a longitudinal magnetization.
- 13. (original) The method according to claim 1, wherein the magnetic medium has a magnetization between a perpendicular magnetization and a longitudinal magnetization.
- 14. (original) The method according to claim 1, wherein irradiating the magnetic medium includes exposing the magnetic medium to an ion dosage of between  $10^{13}$  ions/cm<sup>2</sup> and  $10^{17}$  ions/cm<sup>2</sup>.
  - 15. (original) The method according to claim 1, wherein irradiating the magnetic

medium includes exposing the magnetic medium to ions using a non-patterned exposure of the magnetic medium.

- 16. (original) The method according to claim 1, wherein the irradiating is performed to increase the areal density of magnetic bits that can be recorded on the medium.
- 17. (withdrawn) A magnetic medium formed by irradiating the magnetic medium with ions to induce exchange coupling between grains of the magnetic medium.
- 18. (withdrawn) The magnetic medium according to claim 17, wherein the ions are selected from the group consisting of H<sup>+</sup>, He<sup>+</sup>, Ne<sup>+</sup>, Ar<sup>+</sup>, Kr<sup>+</sup>, and Xe<sup>+</sup>.
- 19. (withdrawn) The magnetic medium according to claim 17, wherein the ions are selected from the group consisting of Ga<sup>+</sup>, Hg<sup>+</sup>, and In<sup>+</sup>.
- 20. (withdrawn) The magnetic medium according to claim 17, wherein the magnetic medium is irradiated with ions having an acceleration voltage of between 10 keV and 100 keV.
- 21. (withdrawn) The magnetic medium according to claim 17, wherein the magnetic medium has been exposed to an ion dosage of between 10<sup>13</sup> ions/cm<sup>2</sup> and 10<sup>17</sup> ions/cm<sup>2</sup>.
- 22. (withdrawn) The method according to claim 17, wherein an areal density of magnetic bits that can be recorded on the medium is increased by the irradiation of ions.
  - 23. (previously presented) A method, comprising:providing a magnetic medium having magnetic grains; and

irradiating the magnetic medium with ions having an acceleration voltage of between 10 keV and 50 keV, in a non-patterned fashion, to increase an areal density of magnetic bits that can be recorded on the medium.

- 24. (original) The method according to claim 23, wherein the ions are selected from the group consisting of H<sup>+</sup>, He<sup>+</sup>, Ne<sup>+</sup>, Ar<sup>+</sup>, Kr<sup>+</sup>, and Xe<sup>+</sup>.
- 25. (original) The method according to claim 23, wherein the ions are selected from the group consisting of Ga<sup>+</sup>, Hg<sup>+</sup>, and In<sup>+</sup>.
  - 26. (canceled)
- 27. (previously presented) The method according to claim 23, wherein irradiating the magnetic medium irradiates the magnetic medium with ions having an acceleration voltage of between 20 keV and 30 keV.
- 28. (original) The method according to claim 23, wherein irradiating the magnetic medium irradiates the magnetic medium with ions having an energy that substantially affects an entire thickness of the magnetic medium.
- 29. (original) The method according to claim 23, wherein irradiating the magnetic medium includes exposing the magnetic medium to an ion dosage of between  $10^{13}$  ions/cm<sup>2</sup> and  $10^{17}$  ions/cm<sup>2</sup>.
- 30. (new) The method according to claim 1, wherein the ions have an atomic mass that is greater than or equal to 20.
  - 31. (new) The method according to claim 23, wherein the ions have an atomic mass

that is greater than or equal to 20.